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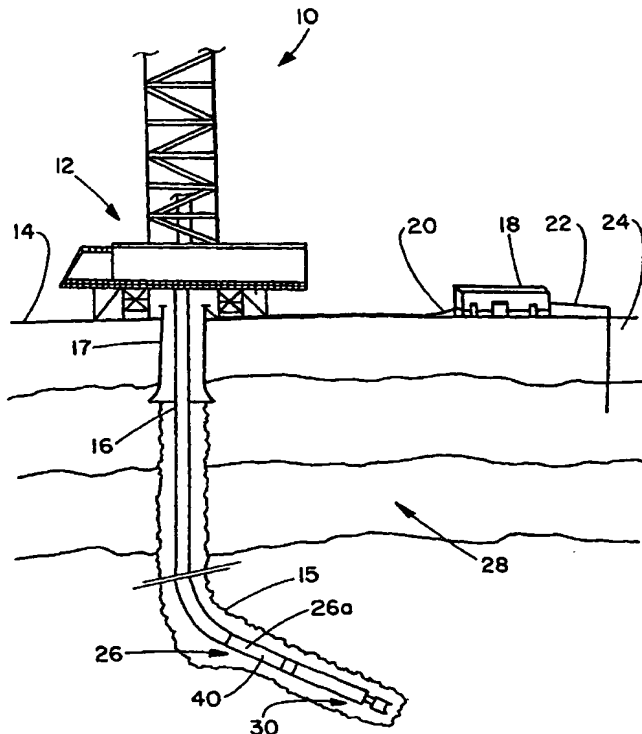
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[Continued on next page]

(54) Title: EXTENDED RANGE EMF ANTENNA



(57) Abstract: A measuring while drilling system (28) typically has a metal pipework (16) extending underground connected to an antenna (26a). The metal pipework (16) and the antenna (26a) are both connected to a type of downhole equipment. The antenna (26a) transmits or receives signals to/from a transceiver (18) located on the surface, and the transceiver (18) is connected to the metal pipework (16) and to a ground (24). The system is improved by joining a plurality of sections of wired drill pipe (40) together to form a section where the antenna (26a) is integral with the metal pipework (16). One end of the section of wired drill pipe (40) is joined to downhole equipment and another end is joined to a conventional metal pipework (16).



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INTERNATIONAL SEARCH REPORT

International application No.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : E21B 47/026, 43/00, 19/00; G01V 3/00; H01J 15/00
 US CL : 175/40, 50; 166/65.1, 85.1; 340/854.3, 854.6; 174/50.52

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
 U.S. : 175/40, 50; 166/65.1, 85.1; 340/854.3, 854.6; 174/50.52

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
 Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,816,344 A (TURNER) 06 October 1998 (06.10.1998), see entire document.	1-17
Y	US 5,927,409 A (TURNER) 27 July 1999 (27.07.1999), see entire document.	1-17
Y	US 4,001,774 A (DAWSON et al) 04 January 1977 (04.01.1977), see entire document.	1-17
Y	US 6,223,826 B1 (CHAU et al) 01 May 2001 (01.05.2001), see entire document.	1-17
A	US 6,367,564 B1 (MILLS et al) 09 April 2002 (09.04.2002), see entire document.	1-17

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

* Special categories of cited documents:

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Continuation of B. FIELDS SEARCHED Item 3:

EAST

search terms: drill string coupling or connection, antenna, wire, sections